

### **Abstract**

A management apparatus reduces the number of pieces of unique information each not generated from another piece of unique information, among unique information being bases of keys assigned  
5 to managed apparatuses.

The management apparatus calculates, for nodes in layers other than tree structure leaves, subsets of apparatus identifiers subordinate to the nodes, searches for a subset wholly containing another subset in the lowermost layer other than a leaf layer from  
10 an immediately-upper layer and mutually associates these subsets, searches for another subset wholly containing the containing subset from a same or an immediately-upper layer and mutually associates these subsets, controls this processing to repeat up to the uppermost layer, controls these processings to repeat on all subsets in the  
15 lowermost layer, makes unique information correspond to subsets in the lowermost layer, and makes information derivatively obtained from the unique information correspond to subsets connected due to the associating.